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ABSTRACT

A Critical Health Manpower Shortage Area (CHMSA) is a medical service area that has inadequate opportunities for access to medical care, mostly primary care (the first line encounter which diagnoses and treats sick or injured people). Most CHMSA's are located far from large population centers. Six hundred seventy three CHMSA's are found in approximately 700 U.S. counties; about a third of these are in the region that includes Alabama, Florida, Georgia, Kentucky, Mississippi, the Carolinas, and Tennessee. Distances, population scarcity, low per capita income, racial discrimination, and communication and organization problems all act as barriers to access to health care. An area designated as a CHMSA may receive manpower assistance from the National Health Service Corp, which pays medical personnel to serve two year terms in an area. Other Health, Education and Welfare programs serving such areas are Community Health Centers, Maternal and Child Health, Family Planning, Migrant Health, and Health Maintenance Organizations. The Rural Health Initiative program will act to coordinate within rural communities those projects funded by separate programs. CHMSA's will receive further assistance from the 200 Health Services Agencies across the U.S. who seek to determine area health needs, set goals, establish criteria for reaching them, and help communities begin implementation. (DS)

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Critical Health Manpower Shortage Areas:

Their Impact on Rural Health Planning

Jeannette Fitzwilliams

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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CRITICAL HEALTH MANPOWER SHORTAGE AREAS: THEIR IMPACT ON RURAL HEALTH PLANNING. Jeannette Fitzwilliams, Economic Development Division, Economic Research Service, U.S. Department of Agriculture, Agricultural Economic Report No. 361.

ABSTRACT

This report describes the 673 medical Critical Health Manpower Shortage Areas (CHMSAs) listed by the Federal Register for February 25, 1975, in terms of the Comprehensive Health Planning (CHP) areas where they are located. It describes how the Rural Health Initiative program is designed to cope with the shortage problem and how this program is related to the work of the Health Service Agencies (HSAs) that are succeeding the CHP councils under the new health planning law. A method for relating CHPs and HSAs in specific areas is indicated.

Of the 416 CHPs into which the United States (excluding Alaska and the New England States) was divided as of May 1973, 269 had one or more CHMSAs. In 99, the CHMSAs covered over one-third of the land area. CHPs with very large urbanized areas had relatively few CHMSAs and only 24 CHMSAs contained an urbanized area. On the average, about the same proportion of CHP areas with Standard Metropolitan Statistical Areas (SMSAs) had CHMSAs as non-SMSA type CHPs—63 percent v. 66 percent.

CHP areas with socioeconomic variables deviating adversely from the average had a high proportion of CHMSAs. In 112 CHPs, all of the CHMSAs were outside a circle of 50-mile radius drawn around urbanized areas of 100,000 or more; in 102, part of the CHMSAs were outside the circle.

Tests made on CHPs with a high probability that CHMSA designation might have been overlooked found few instances of potential omission. However, findings suggest that possibly different criteria are needed for medical service areas characterized by a large land area with very few residents.

Keywords: Health, Health services, Health needs, Rural, Population distribution, Minority groups, Income, Transportation, and Housing.

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Critical Health Manpower Shortage Areas:
Their Impact on Rural Health Planning

By Jeannette Fitzwilliams, Economist
Economic Development Division

CHMSAs and the National Health Service Corps

A Critical Health Manpower Shortage Area (CHMSA) is a medical service area that has inadequate opportunities for access to medical care—mostly primary care.[1] Ideally, a medical service area is an area where (due to availability of medical personnel and facilities, and transportation, trade, or employment patterns) residents normally seek care. As a matter of political reality and statistical feasibility, the areas designated usually coincide with county boundaries. Some consist of one or more townships within a county; a few consist of two or more whole counties or a group of towns that cross county lines.

The Federal Register of February 25, 1975, contained a list of 673 Critical Health Manpower Shortage Areas—Medical. They are to be found in approximately 700 of the country's 3,141 counties.[2]

Designation as a CHMSA makes a medical service area eligible for assignment of National Health Service Corps personnel. The Corps was created by the Emergency Health Personnel Act of 1970 (Public Law 91-623). Under this Act, the Department of Health, Education, and Welfare (HEW) recruits and pays the salaries of physicians, dentists, nurse practitioners, and physicians' assistants. The community provides the office, supplies, and support staff and takes care of the administrative and financial details. Patients pay a fee for service at the usual and customary rate, but no patient is refused service because of inability to pay. The fees so collected go to reimburse HEW and the community for the costs of the practice. Any surplus goes to the community to be used to improve its health care system.

Corps personnel normally serve for a 2-year term. It is hoped that by the end of that period the practice will become so firmly established that the practitioners will stay on and, with the continued support from the community (mostly of a nonfinancial nature), continue to provide adequate primary health care to the community.

In July 1974, the Corps had 405 professionals in 206 communities in 46 States. By the end of 1975, the Corps was deployed as follows:

325 physicians at	227 sites
80 dentists at	79 sites
146 physician extenders at (nurse practitioners or physician assistants)	94 sites
551 total personnel at	268 sites

When the Corps started, most physicians joining the Corps had just completed their internship training. Therefore, most of them expected to leave the sites where they had been placed after 2 years to take up residencies and complete their medical training. This, coupled with the usual start-up problems that plague any new program, initially resulted in a low retention rate. By 1974, the retention rate had risen to 28 percent and is expected to continue to improve. In 1976, physician's pay in the Public Health Service Commissioned Corps amounts to $31,000 including a bonus (variable incentive pay) of $12,500. This compares favorably with what a new, fully trained doctor can expect to earn in the private sector. Currently, 65 percent of the physicians recruited for the Corps sites are board eligible or certified, having completed their training. There is, therefore, no need for them to leave their new practice.

[1] Primary health care is the first line encounter which diagnoses and treats sick or injured people. Secondary care refers to the care—frequently in a hospital—of a more specialized nature. Tertiary care is the intensive and highly specialized care needed by only a few.

[2] There were several discrepancies between the listing in the Federal Register of February 25, 1975, and the master list dated February 12, 1975, on which it was based. This report is based on the latter. See Appendix A for the criteria used to designate an area. The same Federal Register also lists Critical Health Manpower Shortage Areas—Dental. There are also several other lists of shortage or scarcity areas qualifying individuals, organizations, or communities for special treatment under various other acts of Congress. Throughout the rest of this report the Critical Health Manpower Shortage Areas—Medical will be referred to simply as CHMSAs.

Purpose of this Report

A mere listing of counties or parts of counties such as appeared in the Federal Register tells us very little about CHMSAs. In order to understand these areas better–the magnitude of the problem, the comprehensiveness of the list, and special problems associated with the CHMSAs and surrounding areas–it is necessary to portray these CHMSAs so that patterns can emerge if they exist.

This report makes use of data currently (June 1976) available as a result of the Economic Research Service's on-going study of Comprehensive Health Planning areas (CHPs) on an areawide basis (*2*).[3] Such a method of organization has value because it relates the CHMSAs to the organizations that were largely responsible for their designation and that may in the future (although under a new name) be responsible for 1) areawide health planning, 2) initial review and comment on proposed solutions to the shortage problem, or 3) providing the technical assistance for such planning. The areas used are the CHP areas[4]–"funded," developing, and undeveloped–as delineated May 1973.

On January 4, 1975–just before the list of CHMSAs appeared in the Federal Register–the President signed into law the new National Health Planning and Resources Development Act of 1974 (Public Law 93-641) (*4*). This Act combined the Comprehensive Health Planning Program with other planning programs such as the Regional Medical Program and the Hill-Burton (facilities construction) Program. This new program blankets the country with new health planning areas known as Health Service Areas with the planning to be done, at the local level, by their governing bodies, Health Service Agencies. The first group of such agencies was designated in the spring of 1976. Since the new Act was passed, the forerunner CHP agencies are being phased out but they continue to operate until replaced. A few CHPs have become the new Health Service Areas (HSAs) with no change in their territory. Many have combined, unchanged or with only minor changes, to form the new, larger areas. Because of the size of the new areas, many of the CHP councils will be transformed into the subarea councils provided for under the new Act and will continue to provide local input to solve local health problems.

Some readers may wish to relate the CHMSAs and CHPs discussed in this report to specific HSAs in which they are interested. This can easily be done by locating boundaries of the HSA on the HSA map (see the pocket on the inside back cover) and then seeing what CHMSAs and CHPs are located in it (the CHMSA-CHP map is also in the pocket on the inside back cover). One quarter of the HSAs were created by combining two or more unchanged CHPs; 24 HSAs cover the same area as the CHPs they succeeded.

If the reader is interested in securing HSA data for any of the variables discussed in AER No. 339–"A Profile of U.S. Comprehensive Health Planning Areas," he will need one or more of the regional supplements (see outside back cover). These supplements provide county-level data which can be used to construct a statistical profile for individual HSAs similar to the profiles these supplements present for CHPs.[5] Supplement footnotes provide information as to how CHPs combined into HSAs and on 314(b) status when Public Law 93-641 was signed.

This publication reports on a preliminary inquiry undertaken to determine some of the questions–and some of the answers–that need to be examined if adequate health care is to be provided for all areas with critical medical manpower shortages.

Among the questions we hope the emerging patterns will help answer are:

1. Where are the CHMSAs? Are they a large or small part of the planning area where they are located? Are there areas of concentration? Are there areas where one might have expected to find a CHMSA but none has been designated?

2. How rural are the CHMSAs?

3. How close are these CHMSAs to centers of population, and hence presumably, to medical resources needed to help solve the problem? How close are they to facilities providing support at the secondary and tertiary level for whatever system of primary health care is devised?

4. Is there any relationship between designation as a CHMSA and the degree of local organization for comprehensive health planning?

5. What is the situation in the multicounty planning area? Is it characterized by problems that will increase the difficulties of implementing an improved health care system? Does it have favorable features that will make solution of the shortage problem easier?

Nearly a Quarter of the Counties are in a CHMSA

For the area covered by this report (which excludes the New England States and Alaska), the Federal Regis-

[3]The number in parenthesis refers to the source in References. A description of how these CHP areas were delineated and characterized will be found in appendix B. Although much of the data characterizing the area comes from the 1970 census, it is the latest available and would be relatively unchanged even after the lapse of a few years. An area that was poor in 1970 would likely still be poor in 1973 (when the CHP study area boundaries were delineated) or in 1974 (when many of the CHMSAs were first designated) or even in 1977 (when this report was published).

[4]"Funded" is written in quotation marks to indicate this category is not limited to CHP agencies funded under section 314(b) of the Public Health Service Act but includes those funded by the Appalachian Regional Commission or with planning being done by the State CHP agency.

[5]If technical assistance is needed to determine the procedure for constructing HSA profiles, contact Health and Education Group, Economic Development Division, Economic Research Service, U.S. Department of Agriculture, Washington, D.C. 20250.

ter listed 711 places[6] consisting of 487 whole counties and parts of 194 additional counties–22.4 percent of the 3,045 counties (table 1). These 711 places in 681 counties make up 667 CHMSAs. About a third of them are in region IV and 15 percent in region VI.[7] Between 32 and 28 percent of the counties respectively in regions IV, IX, VIII, and III are involved. A glance at the map (back cover pocket) will show bands of concentration from Virginia to Kentucky, from Alabama to Eastern Oklahoma, in the Dakotas, and–because of the size of the counties–in parts of the southwest.

These 667 CHMSAs are in 269 of the 416 CHP areas–"funded," organizing, or undeveloped–into which the study area has been divided (table 2). The CHP boundaries, as delineated by the State CHP agencies May 1973, are shown on the map. The proportion of CHPs with CHMSAs varied from 37 percent in region II to 87 percent in region IV. Very few are in areas consisting of "SMSA counties only with largest urbanized area 500,000 or more." Otherwise, by area type, the percentage of CHPs without CHMSAs showed no pattern.[8]

Only a small proportion of the U.S. population lives in a CHMSA. Only 24 of the CHMSAs include any urbanized area residents (table 1–footnote 2). In the absence of population data, CHPs have been categorized by the amount of their land area covered by the CHMSA.[9] CHMSAs cover over two-thirds of the area in only seven CHPs (table 2). In only regions III and IV

[6]The Federal Register listed each county or part of a county separately. These are the places counted in table 1. A county was only counted once even if it was listed several times. There are more counties than CHMSAs because in several instances counties combined to make a CHMSA. The New England States and Alaska are omitted for statistical reasons.

[7]The States covered by each region are noted in table 2.

[8]An SMSA is a county containing a city of 50,000 or more, or a county closely related to such a county. The urbanized area includes the core city and the highly developed area surrounding it, i.e., the urban sprawl. CHP areas were categorized as to area type according to 1) whether their component counties were all SMSAs, non-SMSAs, or mixed, and 2) the size of the largest urbanized area or city. This size was that of the urbanized area rather than that portion located within the CHP area.

[9]Population data are not available because CHMSAs do not always follow county lines.

Table 1–Critical Health Manpower Shortage Areas (CHMSAs): County and Comprehensive Health Planning (CHP) area status[1]

Geographic area	Separate places in Federal Register	Counties in CHMSAs			CHMSAs			CHMSAs by SMSA rating[2]				Total U.S. counties
		Total	Whole	Parts	Total	In only one CHP	In two or more CHPs	1:W	1:UA	1:R	2	
	Number											
United States	717	–	–	–	673	–	–	20	4	31	14	–
Region I (New England)	5	5	0	5	5	not available		0	1	0	0	–
Alaska[3]	1	not available			1	not available		0	0	0	0	–
Study area (United States, except New England and Alaska) =												
All CHP areas	711	681	487	194	667	653	14	20	3	31	14	3,045
Regions:[4]												
II	10	10	1	9	7	6	1	0	0	1	3	85
III	82	79	40	39	73	69	4	4	1	5	1	282
IV	241	232	191	41	229	226	3	5	0	2	6	722
V	79	76	53	23	70	67	3	4	0	5	2	540
VI	102	101	84	17	100	100	0	6	0	3	2	501
VII	50	50	43	7	48	47	1	1	0	0	0	419
VIII	88	86	61	25	85	84	1	0	0	0	0	284
IX	41	29	7	22	37	36	1	0	2	14	0	93
X	18	18	7	11	18	18	0	0	0	1	0	119

[1]These are CHP areas–"funded," developing, or undeveloped–as delineated by each State CHP agency May 1973. Boundaries do not necessarily agree with those of 314(b) agencies, particularly when these included only the counties close to an SMSA.

[2]The symbols under SMSA (Standard Metropolitan Statistical Area) rating have the following meanings:

1:W = SMSA county with urbanized area: CHMSA covers whole of county.

1:UA = SMSA county with urbanized area: CHMSA covers some of urbanized area.

1:R = SMSA county with urbanized area: CHMSA covers rural part of county only.

2 = SMSA county without any urbanized area: CHMSA covers whole or part of county.

[3]Whole of Alaska is designated a Critical Health Manpower Shortage Area with the exception of the Anchorage and Fairbanks Division.

[4]See table 2 for States in each region.

Sources: See appendix B.

Table 2–Summary of CHP areas by their status with regard to CHMSAs, showing estimates of land area covered

Regions and CHP area types	All CHP areas	No CHMSAs	With CHMSAs				Land area coverage			
			Total	Land area			Total	No CHMSAs	Under 1/3	Over 1/3
				Under 1/3	1/3-2/3	Over 2/3				
	Number						*Percent*			
All CHP areas	416	147	269	170	92	7	100	35	41	24
Regions:[1]										
II	16	10	6	6	0	0	100	63	37	0
III	46	20	26	11	12	3	100	43	24	33
IV	84	11	73	35	36	2	100	13	42	45
V	58	24	34	28	6	0	100	41	48	10
VI	57	18	39	27	11	1	100	32	47	21
VII	54	26	28	23	5	0	100	48	43	9
VIII	45	10	35	20	14	1	100	22	44	33
IX	24	10	14	9	5	0	100	42	37	21
X	32	18	14	11	3	0	100	56	34	9
Area type:										
500,000 and over										
SMSA only	14	10	4	3	1	0	100	71	21	7
Mixed	35	15	20	12	8	0	100	43	34	23
SMSA and mixed:										
250,000-500,000	30	11	19	14	4	1	100	37	47	17
100,000-250,000	65	18	47	30	15	2	100	28	46	26
50,000-100,000	52	18	34	21	12	1	100	35	40	25
Non-SMSA only:										
25,000-50,000	81	28	53	35	17	1	100	35	43	22
10,000-25,000	90	29	61	43	17	1	100	32	48	20
Under 10,000	49	18	31	12	18	1	100	37	24	39

[1] Region I = New England
II = N.J., N.Y.
III = Del., D.C., Md., Pa., Va., W. Va.
IV = Ala., Fla., Ga., Ky., Miss., N.C., S.C., Tenn.
V = Ill., Ind., Mich., Minn., Ohio, Wisc.
Region VI = Ark., La., N. Mex., Okla., Texas
VII = Iowa, Kans., Mo., Nebr.
VIII = Colo., Mont., N.D., S.D., Utah, Wyo.
IX = Ariz., Calif., Hawaii, Nev.
X = (Alaska), Idaho, Oreg., Wash.

Sources: See appendix B.

or area type "non-SMSA only with no town as large as 10,000" do the number of CHPs with over a third of their area covered exceed those with only a small portion of the land covered.

Most CHMSAs Far From Large Population Centers

As might be expected, both absolutely and relatively, the CHPs with CHMSAs furthest from large centers of population (where specialized facilities and personnel tend to congregate) are in regions VI, VII, VIII, and X. None of the region VIII and X CHMSAs are within 50 miles (in a straight line) of a city of 100,000 (table 3).

By area type, if the largest urbanized area in the CHP is under 100,000, well over half of all CHPs have all their CHMSAs more than 50 miles from the center of an urbanized area. However, it is well to note that many of the planning areas with large cities also have CHMSAs that are far distant from such centers.

Whatever method is used to provide access to primary health care–be it resident physicians or physician extenders–support, secondary, and tertiary care will have to come from outside the CHMSA. Much of the secondary care and support can be provided by facilities located in nearby medium-sized towns. However, in general, the facilities for tertiary care and those best able to supply the necessary back-up expertise are likely to be located much farther away. Preferably, one would have measured the distance to the regional or teaching hospital actually providing the needed specialized care or support. However, such data were not readily available. So, for this report, use was made of an already constructed map showing the area within a 50-mile radius (in a direct line) from the center of all urbanized areas with 100,000 or more residents.

Those working to provide adequate full range care for the medically underserved communities located in the 55 CHPs with all of their CHSMAs within such a circle may find their task relatively easy. The job of the

Table 3--Characterization of CHP areas with regard to proximity of CHMSAs within their borders to urbanized areas of 100,000 or more

Regions and CHP area types	All CHP areas	No CHMSAs	CHPs with CHMSAs within circle of 50 miles radius around city of 100,000[1]		
			All	Some	None
	Number of CHP areas				
All CHP areas	416	147	55	102	112
Regions:					
II	16	10	5	1	0
III	46	20	6	12	8
IV	84	11	20	37	16
V	58	24	13	12	9
VI	57	18	2	19	18
VII	54	26	7	4	17
VIII	45	10	0	6	29
IX	24	10	2	7	5
X	32	18	0	4	10
Area type:					
500,000 and over:					
SMSA only	14	10	2	2	0
Mixed	35	15	9	10	1
SMSA and mixed:					
250,000-500,000	30	11	11	6	2
100,000-250,000	65	18	24	21	2
50,000-100,000	52	18	1	13	20
Non-SMSA only:					
25,000-50,000	81	28	3	17	33
10,000-25,000	90	29	4	20	37
Under 10,000	49	18	1	13	17

[1] An overlay map with circles of 50-mile radius around the center of each urbanized area of 100,000 or more was put over a map showing the CHMSAs by CHP area. Each CHP was then classified by inspection as to whether all, some, or none of the CHMSAs within the area were also within the circle. Therefore, in very close cases, errors could have occurred. Furthermore, it should be remembered these distances are "as the crow flies;" distances by car would be greater.
Sources: See appendix B.

planner in the 112 CHP areas where none of the CHMSAs are close to a large city may be more difficult.

In both the Appalachian Region and the mountainous areas of the west, road distances may be much greater than 50 miles, even for those within the circle. In these areas, too, roads may be impassable at times during the winter, thus making the task of ensuring health care that much more difficult.

Designation List may be Comprehensive, Given Criteria

It is important to determine whether the list of CHMSAs in the Federal Register is comprehensive, both within the framework of the set of criteria selected to determine designation, and also in terms of how adequately these criteria identified areas with major problems of access to primary care. While the immediate result of designation as a CHMSA is to enable the medical service area to apply for manpower assistance from the National Health Service Corps, such a designation can have broader implications. By defining the size and location of a scarcity area, it can direct attention to that area and thus help to cause an increased flow of funds to that area. The solution of the shortage problem will not be confined to use of the National Health Service Corps mechanism alone. Characterization of an area as a CHMSA may also be a factor in the planning and carrying out of health-related research.

Two tests were used to indirectly determine the comprehensiveness of designation and the adequacy of criteria. The first attempt was made by comparing the presence or absence of CHMSAs in those CHPs with the lowest ratios of employed physicians, dentists, and related practitioners as reported in the 1970 Census of Population. The census figure includes all kinds of doctors, including those employed by the Federal Government and those doing research or teaching. It also includes all types of medical specialties as well as dentists and others. In addition, the CHP would include those practicing in cities as well as rural areas. Therefore, a high ratio would be no test of the absence of potential scarcity areas. However, it was reasoned that a very low ratio would be indicative of shortage areas.

There are 74 CHP areas where the ratio of physicians was less than 1.5 per 1,000 population (table 4). Eighteen of them—only 24 percent— had no CHMSA. This compares with 35 percent for all CHP areas (table 2).

These 18 areas were subjected to a further test. The number of physicians employed in patient care was obtained from the *Distribution of Physicians in the United States, 1970* (*1*) for each county in these areas. This figure was then compared with the 1970 population count for that county. On the assumption there had been no change in medical personnel between 1970 and the latter part of 1974, and on the further assumption that each county was synonymous with a medical service area, then only 6 of 18 CHPs could have been expected to apply for one or more CHMSA designations. For most of the counties in the remaining 12 CHPs, the ratios were such that a considerable loss of doctors would have been required to qualify the county as a CHMSA.

This latter test was also performed for the 11 CHPs without CHMSAs that were large (10,000 square miles or more) and had small populations (under 200,000). Only 2 of these 11 CHPs would have been expected to have CHMSAs. However, this exercise turned up an interesting point. Many of these counties—larger in area than a whole multi-county planning area elsewhere—had only one or two doctors but failed to qualify for CHMSA designation since they only had a few thousand people. This raises the question: should there be special criteria for designating CHMSAs in large, sparsely populated medical service areas?

The Relationship Between CHMSA Designation and CHP Formation Status is Indeterminate

While 35 percent of all CHP areas had no CHMSAs, only 28 percent of "funded" CHP areas had no CHMSA designated (table 5). The percentage for CHPs without CHMSAs was the same—43 percent—whether the area was undeveloped or developing. Within regions, except in regions VIII and IX, the greatest proportion of CHPs with CHMSAs are among those that are "funded." The difference is particularly great in region III. By area type, if the largest urbanized area had 250,000 or more residents so few CHP areas were not "funded" that no

Table 4—CHP areas with a low ratio of physicians, dentists, and other practitioners—under 1.5 per 1,000 population—by CHMSA status, 1970

Regions and CHP area types	All CHP areas	CHP areas with a low ratio of practitioners			
		Total	No CHMSA	With CHMSAs land area status	
				Under 1/3	Over 1/3
	Number	*Number*	*Percent*		
All CHP areas	416	74	24	39	36
Regions:					
II	16	0	0	0	0
III	46	12	42	17	42
IV	84	33	15	36	48
V	58	3	33	67	0
VI	57	13	8	69	23
VII	54	4	75	25	0
VIII	45	5	0	40	60
IX	24	3	100	0	0
X	32	1	0	100	0
Area type:					
500,000 and over:					
SMSA only	14	0	0	0	0
Mixed	35	0	0	0	0
SMSA and mixed:					
250,000-500,000	30	0	0	0	0
100,000-250,000	65	3	33	33	33
50,000-100,000	52	8	25	50	25
Non-SMSA only:					
25,000-50,000	81	16	25	56	19
10,000-25,000	90	25	20	52	28
Under 10,000	49	22	27	18	55

Sources: See appendix B.

comparison could be made. If the largest city was 10,000 or over, "funded" areas were much more likely to have a CHMSA. But if the largest city was under 10,000, there seemed to be little difference by formation status.

Within each formation status, comparisons should not be made between regions or area types without looking at table 2, since most of the variation is due to regional differences not ascribable to formation status.

In fact, a higher proportion of "funded" CHPs appear to have CHMSAs. However, there are so many factors involved—some offsetting the potential influence of "funded" status and some reinforcing it—that no definitive conclusions should be drawn as to the extent of the effect of formation status on designation. Among these factors are the following:

Application for designation as a CHMSA could have been made by a CHP agency or a community organization (usually with the State agency kept informed and given a chance to comment). The application then went to the National Health Service Corps and the Bureau of Health Manpower for their approval. As far back as 1972 planning agencies were asked to identify scarcity areas. A list was assembled in April 1974. The Division of Comprehensive Health Planning, HEW, cooperated by sending this list, together with requests for comments and additions, to all the 314(b) and (a) agencies plus those other health groups with which the Division kept in close contact. A revised list was published in the Federal Register for October 18, 1974. Again comments and additions were requested, resulting in the February 25, 1975, list used for this report.

To be designated, a community not only had to meet the requirements for a shortage area but someone had to know CHMSA designation was possible. Even more important, someone had to see that an application was filed and follow through on it. CHPs that were 314(b) funded agencies not only were reminded of the existence of the program but had the expertise to fill out the application. Therefore, it is not surprising to find a high proportion of "funded" CHPs with a CHMSA.[10]

The more affluent and resourceful areas were the ones most likely to have 314(b) agencies (2) and therefore, the ones most likely to ferret out shortage areas. On the other hand, such areas were the ones most likely to have already attracted and retained medical personnel

[10]The boundaries of the CHP areas used in this report were delineated on a long-term basis and did not always coincide with the boundaries of a funded agency. Therefore, even some "funded" agencies might not have reviewed the shortage situation in all counties assigned to their CHP area.

Table 5—CHMSA status of CHP areas, by their formation status

Regions and CHP area types	All CHP areas	"Funded"			Developing			Undeveloped		
		Total	No CHMSA	With CHMSAs	Total	No CHMSA	With CHMSAs	Total	No CHMSA	With CHMSAs
	Number	*Number*	*Percent*		*Number*	*Percent*		*Number*	*Percent*	
All CHP areas	416	210	28	72	150	43	57	56	43	57
Regions:										
II	16	11	55	45	3	67	33	2	100	0
III	46	26	19	81	14	64	36	6	100	0
IV	84	43	12	88	24	20	80	17	12	88
V	58	43	35	65	7	71	29	8	50	50
VI	57	26	19	81	26	42	58	5	40	60
VII	54	12	17	83	37	57	43	5	60	40
VIII	45	16	44	56	21	10	90	8	12	88
IX	24	20	40	60	1	0	100	3	67	33
X	32	13	46	54	17	59	41	2	100	0
Area type:										
500,000 and over:										
SMSA only	14	12	67	33	1	100	0	1	100	0
Mixed	35	33	42	58	2	50	50	0	0	0
SMSA and mixed:										
250,000-500,000	30	26	38	62	2	0	100	2	50	50
100,000-250,000	65	42	21	79	17	47	53	6	17	83
50,000-100,000	52	27	11	89	21	57	43	4	75	25
Non-SMSA only:										
25,000-50,000	81	32	22	78	36	47	53	13	31	69
10,000-25,000	90	24	12	88	48	35	65	18	50	50
Under 10,000	49	14	36	64	23	35	65	12	42	58

Sources: See appendix B.

or devised other means to provide adequate access to primary care. Therefore, they were the least likely to have a shortage area.

One possible reason for the high percentage of "funded" CHPs in regions III and IV with CHMSAs is that this group includes areas financed by the Appalachian Regional Commission and, therefore, there was a high probability the communities themselves may have taken action to obtain designation.

The similarity between developing and undeveloped CHPs by formation status at the all-CHP area level, and the failure of any consistent pattern to emerge when the areas are studied by regions and area types, may be due to the course of funding since May 1973, the date when the codes were set. At that date many of the developing areas expected to be funded shortly as 314(b) agencies. However, most of the additional 314(b) funds in the new fiscal year went to already-funded agencies to enable them to do a better job, and very few developing agencies were funded. When funds did not materialize, some agencies continued to organize and plan while others merely stayed "alive" and performed only the most basic tasks—frequently through volunteers.

A check on the formation status of the eight areas discussed in the previous section (which, on the basis of the American Medical Association's 1970 list of physicians, would have qualified) shows that four were developing and three were undeveloped in Mav 1973.

Association Between CHP Characteristics and CHMSA Designation

By Region—The profile of CHP areas (*2*) found CHP areas in region IV far above the average with regard to the percentage of minority residents, people in poverty, houses lacking plumbing, and the infant mortality rate. The same was true, though to a lesser extent, for regions III and VI. On the other hand, areas in regions II, V, IX, and X were below the average for the latter three variables. Therefore, one is not surprised to find in table 2 that regions IV and VI have a high percentage and regions II and X have a low percentage of areas with CHMSAs. The high proportion in region VIII might also be expected in view of the highly rural nature of this region and the very few, widely separated urbanized areas. If the regions were ranked by the percentage of CHPs without CHMSAs, region III would have an unexpectedly high rank and region V an unexpectedly low rank. While West Virginia is mostly covered by CHMSAs, there are few in Delaware, Maryland, and Pennsylvania (see map). In region V, the CHMSAs are found mostly in the Appalachian and Upper Great Lakes sections.

By Area Type—The profile (*2*) tables of averages usually showed steady progressions from most to least favorable for each socioeconomic variable studied as the eye descended from "SMSA only with largest urbanized area 500,000 or more" to "non-SMSA with no town as large as 10,000." The findings as to percentage of CHPs with CHMSAs do not follow this pattern (table 2). Although 71 percent of the SMSA only CHPs with the largest urbanized areas have no CHMSAs, percentages for the rest of the area types with CHMSAs lie within a narrow range and no pattern emerges.

When all CHPs with SMSAs are compared to all CHPs without SMSAs, the likelihood of having a CHMSA is practically the same: 63.3 percent v. 65.9 percent (table 6). One reason for this similarity is probably the method of tabulation. Equal weight was given to a CHP with one CHMSA as to a CHP with many CHMSAs. Even a relatively fortunate CHP may have one medical service area that is a critical shortage area.

An alternative explanation for this similarity that could be explored is the possibility that the greater organizational development of the SMSA CHPs (implying greater likelihood of designation) offsets the better socioeconomic situation of this type of CHP area. A certain amount of credence is lent to this hypothesis when the CHPs with the largest deviations from the average are compared by major area type. There is also a possibility that further study would show that differences in mix between the detailed area types are offsetting, thus resulting in the apparent similarity of experience.

Wide Deviations From the Average Aggravate the Problem—What is the effect of a wide adverse deviation from the average upon the problem of how best to overcome inadequate access to health care in rural communities? The answer to this question would be most helpful in determining the best solution for a given area. Primarily, the responsibility for solving the shortage problem lies with the medical service area itself. However, the nature and extent of the adverse conditions and the direction of probable growth of the whole planning area can have a powerful influence both on the options open to the shortage area and its ability to attract and retain whatever health personnel and facilities are decided upon.

Distance adds to costs for both patient and provider. The greater the distance, the less likely the patient is to seek medical help and the more serious his problem is likely to be when he does come for help (*5*). Distance has also been found to affect the course of treatment, particularly with regard to referral and length of stay in a hospital (*5*). Fifty seven of the 269 CHP areas with CHMSAs cover over 10,000 square miles (table 6: 19 + 38 = 57, also table 7).

Population size has also been found to be a prime factor in determining the location of doctors (*6*, p. 22). The population in 128 of the CHPs with CHMSAs was under 200,000 in 1970. Small populations in a medical service area present particular difficulty because in such areas the population base needed to support the minimum size staff for adequate and continuous service may be missing. Coordination with adjacent primary health services may be needed to overcome this problem. But coordination between communities or organizations may itself introduce problems. Furthermore, as the ter-

Table 6—Association between presence of CHMSAs and selected characteristics of CHP areas, by size of largest urbanized area or city

CHP area characteristics		Largest urbanized area 50,000 or more				CHPs with largest city under 50,000			
		Total		With CHMSAs		Total		With CHMSAs	
	Total (1)	Number (2)	Pct. of Col. 1 (3)	Number (4)	Pct. of Col. 2 (5)	Number (6)	Pct. of Col. 1 (7)	Number (8)	Pct. of Col. 6 (9)
	Number		*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
All CHP areas	416	196	47.1	124	63.3	220	52.9	145	65.9
Size of CHP area:									
10,000 or more square miles	75	26	34.7	19	73.1	49	65.3	38	77.6
Population density under 10/square mile	67	5	7.5	4	80.0	62	92.5	46	74.2
Population: under 100,000	93	2	2.2	1	50.0	91	97.8	54	59.3
Population: 100,000-200,000	105	19	18.1	13	68.4	86	81.9	60	69.8
Type of population:									
50 percent or more rural residents	205	30	14.6	25	83.3	175	85.4	120	68.6
25 percent or more minority residents	65	32	49.2	25	78.1	33	50.8	22	66.7
25 percent or more poor[1]	74	22	29.7	20	90.9	52	70.3	47	90.4
Variables related to health care:									
28 or more infant deaths/1,000 births[2]	66	19	28.8	16	84.2	47	71.2	34	72.3
Under 1.5 doctors etc./1,000 population	74	11	14.9	8	72.7	63	85.1	48	76.2
20 percent or more houses lack plumbing	58	8	13.8	8	100.0	50	86.2	39	78.0
25 percent or more houses lack phones[3]	76	18	23.7	16	88.9	58	76.3	49	84.5

[1] The poor are those below the poverty line as defined for the 1970 census.
[2] This is the average annual rate for 1966-68.
[3] More correctly this refers to the heads of household who could not be reached by phone; the phone could be located anywhere.

Sources: See appendix B.

Table 7—Association between presence of CHMSAs and selected characteristics of CHP areas, by land area coverage

CHP area characteristics	Total	No CHMSA	With CHMSAs		
			Total	Land area	
				Under 1/3	Over 1/3
	Number	*Percent*			
All CHP areas	416	35	65	41	24
Size of CHP area:					
10,000 or more square miles	75	24	76	55	21
Population density under 10/square mile	67	25	75	46	28
Population: under 100,000	93	41	59	30	29
Population: 100,000-200,000	105	30	70	44	26
Type of population:					
50 percent or more rural residents	205	29	71	41	29
25 percent or more minority residents	65	28	72	37	35
25 percent or more poor[1]	74	9	91	46	45
Variables related to health care:					
28 or more infant deaths/1,000 births[2]	66	24	76	39	36
Under 1.5 doctors etc./1,000 population	74	24	76	39	36
20 percent or more houses lack plumbing	58	19	81	38	43
25 percent or more houses lack phones[3]	76	14	86	45	41

[1] The poor are those below the poverty line as defined for the 1970 census.
[2] This is the average annual rate for 1966-68.
[3] More correctly this refers to the heads of household who could not be reached by phone; the phone could be located anywhere.

Sources: See appendix B.

ritory providing the population base for the service increases, the problems of distance mentioned above become more acute.

In the past and possibly even today, racial discrimination has acted as a barrier to access to health care, creating distortions of the delivery system that may have to be overcome (5, p. 66). Problems of communication and organization are also likely to be greater. Even if these are not current problems, as a result of past neglect, the number and nature of the medical problems presented by minority groups may create an above-average burden. In 47 of the CHPs with CHMSAs, 25 percent or more of the residents belong to minority groups. This is 72 percent of CHPs with large minority groups.

Several studies have found that per capita income is second only to population size in determining the location of doctors (5, p. 22). Only 14 of the CHPs with CHMSAs were found to have per capita incomes of $3,250 or more. For the study area as a whole, 41 CHPs had per capita incomes that high; the all-area average was $3,122. On the other hand, in 67 of the CHPs with CHMSAs, 25 percent or more of the residents were below the poverty line. This might not only be a deterrent to health personnel but could pose problems for the community in devising a health delivery system that would be financially self-sustaining, especially where CHMSAs covered much of the CHP.

Lack of ready access to a phone may pose problems for both patients and the efficient operation of any health care system. In 65 of the CHPs with CHMSAs, at least one fourth of household heads told Census enumerators they could not be reached by phone.

Adequate health care means a full range of services, not just access to primary care. Many of these services will only be found in centers of population. Yet a disproportionate number of CHPs with potential problems—a high percentage of them with a CHMSA—do not have a center of population of at least 50,000.

A disproportionate number of CHPs with potential problems have CHMSAs.

Fifty five CHPs with a CHMSA have Multiple Potential Problems—Critical health care shortages are going to be much harder to solve if they are found in CHP areas with multiple potential problems. Areas with a combination of five potential problems were selected for special tabulation (table 8). High infant mortality and lack of plumbing were chosen as indicative of poor health. A high percentage of poverty was thought to be indicative of payment, financing, and funding problems as well as poor health. Large minority populations and poor access to a phone were chosen because of the problems they might present in devising a delivery system that would reach all people.

There were 64 CHP areas that had three or more of these characteristics. Of these, 55 CHPs—86 percent—had one or more CHMSAs. All but 15 of those with CHMSAs contained no large center of population. The residents of all but 11 were over half rural. Thirty seven of these areas were characterized as having a high infant mortality rate. Nineteen of the areas with a total of 53 CHMSAs had all five characteristics. All these latter CHPs were over half rural; only two had large cities.

Growth Patterns of CHP areas with CHMSAs

Population growth pattern is one characteristic of both CHMSAs and their host CHPs that planners will consider carefully in selecting the method of health care delivery, its scale and location. When the annual rate of growth of CHPs compounded annually is compared for the periods 1960 to 1970 and 1970 to 1972, no consistent pattern with regard to the presence or absence of CHMSAs emerges.

The highest proportion of CHPs with a CHMSA were in the group where population increased after a decline (i.e., turned up) (table 9). The lowest percentage was in the group where population was still rising in 1970-72, but much less than in the 1960-70 period.[11] In CHPs where the population was increasing at an accelerating rate, the CHMSAs covered relatively little territory.

That the highest percentage of CHPs with CHMSAs is in the group that is turning up poses several questions. Is the growth occurring in the shortage areas? Is the growth so recent or so little recognized that it has not yet attracted health personnel? Could it be that even growth will not be sufficient to overcome the preference of health personnel for areas with urban as well as growing populations?

Possibly, this latter hypothesis is refuted by the record of the CHP areas showing a fast acceleration of their growth rate in these two time periods. Among non-SMSA area types, only 52 percent of such areas had CHMSAs—a much lower than average proportion. However, SMSA area type CHPs had an above-average proportion with CHMSAs. Was this because the rapid growth was occurring near but outside the big cities with the increases in physicians failing to keep pace?

Only 21 of the 416 CHP areas are continuing to decline; the proportion with CHMSAs is close to the average. Is this unexpectedly favorable finding due to the fact population is declining faster than doctors are retiring? Will many of these medical service areas become CHMSAs in a few years?

CHMSAs and HEW's Rural Health Initiative

What can be done about the CHMSA problem?

One answer is HEW's Rural Health Initiative. The CHMSAs were designated primarily for use in connection with the National Health Service Corps. The Corps is one of six programs that make up the Bureau of Community Health Services in HEW. The others are: Community Health Centers, Maternal and Child Health, Family Planning, Migrant Health, and Health Maintenance Organizations. Until recently, these six programs have been operating more or less independently, with

[11] Population was rising, but decelerating fast (table 9).

Table 8–CHMSA status in multiple problem CHP areas[1]

Number of problems and regions	Total	CHMSA status		With CHMSAs			
				Includes urbanized area of 50,000 or more		50 percent or more are rural residents	
		Yes	No	Yes	No	Yes	No
	Number of CHP areas						
Any three problems:							
Region III	8	5	3	0	5	5	0
Region IV	41	37	4	9	28	31	6
Region VI	12	10	2	6	4	5	5
Region VII	2	2	0	0	2	2	0
Region IX	1	1	0	0	1	1	0
Infant mortality and any other two problems:							
Region III	4	2	2	0	2	2	0
Region IV	33	29	4	7	22	24	5
Region VI	6	4	2	2	2	3	1
Region VII	1	1	0	0	1	1	0
Region IX	1	1	0	0	1	1	0
All five problems:							
Region III	2	1	1	0	1	1	0
Region IV	19	17	2	2	15	17	0
Region VI	0	0	0	0	0	0	0
Region VII	0	0	0	0	0	0	0
Region IX	1	1	0	0	1	1	0

[1] Multiple problems are operationally defined as listed below:
A CHP area was chosen for study if it was characterized by any three of these wide deviations from the average:
25 percent or more minority residents
25 percent or more below the proverty line
28 or more infant deaths per 1,000 live births
20 percent or more of houses lacked plumbing
25 percent or more had no ready access to a phone

Sources: See appendix B.

the result that two or more might be serving the same community, each with its separate building and staff. This is not only costly from the point of view of program administration, but it can be inconvenient from the point of view of the user and his family.

Major efforts to improve rural health care delivery have been in progress for over 10 years now. One of the things that has been learned is that one program operating in isolation is more likely to fail and is less effective in impacting on health problems. What is needed is a concerted, comprehensive, and coordinated attack (*3* and *7*, p. 131-3).

This might be described as a system of linkages–some to services in the same building and sharing staff; others wholly independent but with agreements covering cooperation and referral. A service providing primary care must be able to provide access to secondary and tertiary care when needed. Emergency as well as regular transportation services must be available. Home health and homemaker services may be needed by those temporarily or chronically incapacitated. Many health problems require a period of rehabilitation before the patient becomes self-sufficient. Consumer education on health matters and how to use the system, as well as many kinds of counseling are needed by the patient and his family. Linkages are shown schematically in figure 1.

It will be noted that many of the programs most closely connected with primary access to health care are to be found in the Bureau of Community Health Services, HEW. The Rural Health Initiative is not a program similar to these because it does not have its own funding. Instead, it is a *management* idea for the coordination within rural communities of the projects which are themselves funded by separate Federal programs. Coordination within the Bureau is possible because of unified administrative control. The establishment of linkages with the institutions on the bottom line of figure 1 or with other programs (private or public) shown surrounding primary care will be achieved as a result of community efforts supported by technical advice and information from Community Health Services representatives at the regional or local level and from the Health Service Agency (HSA) which plans for health needs on an areawide basis.

Table 9–Population growth patterns of CHP areas with and without CHMSAs, by selected CHP characteristics[1]

Growth patterns[1]	All CHP areas					Largest urbanized area 50,000 or more				Largest city under 50,000			
			With CHMSAs			Total		With CHMSAs		Total		With CHMSAs	
				Land area									
	Total (1)	No CHMSA (2)	Total (3)	Under 1/3 (4)	Over 1/3 (5)	Total (6)	Pct. of Col. 1 (7)	Total (8)	Pct. of Col. 6 (9)	Total (10)	Pct. of Col. 1 (11)	Total (12)	Pct. of Col. 10 (13)
	Number	*Percent*				*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*	*Number*	*Percent*
All CHP areas	416	35	65	41	24	196	47.1	124	63.3	220	52.9	145	65.9
Turning up	88	19	81	43	38	19	21.6	15	78.9	69	78.4	56	81.2
Rising: Accelerating fast	142	39	61	43	18	54	38.0	41	75.9	88	62.0	46	52.3
Accelerating slowly	55	38	62	47	15	32	58.2	19	59.4	23	41.8	15	65.2
Decelerating slowly	53	34	66	38	28	41	77.4	26	63.4	12	22.6	9	75.0
Decelerating fast	35	60	40	29	11	34	97.1	13	38.2	1	2.9	1	100.0
Turning down	22	32	68	36	32	14	63.6	9	64.3	8	36.4	6	75.0
Continued decline	21	38	62	33	29	2	9.5	1	50.0	19	90.5	12	63.2
CHPs that declined 1960 to 1972	78	24	76	38	37	15	19.2	13	86.7	63	80.8	46	73.0

[1] The growth pattern compares the rate of population growth for the period 1970 to 1972 with that for the period 1960 to 1970. The growth rate is the annual rate compounded annually. The categories, "fast" and "slowly," were determined by whether the change in the growth rate from the previous period was greater or less than half a percentage point.

Source: Based on tapes from the Bureau of the Census giving population estimates by county for 1960, 1970 and 1972.

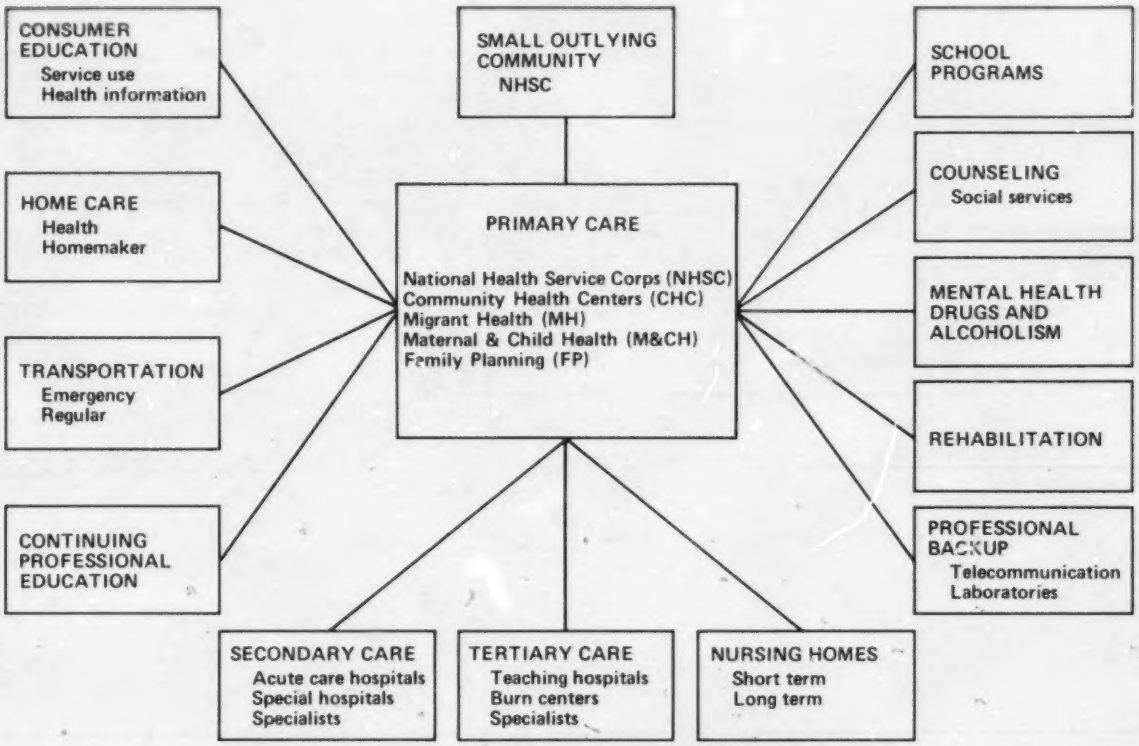

Figure 1. The Rural Health Initiative linkage system.

The Rural Health Initiative and HSAs

The National Health Planning and Resources Development Act of 1974 (Public Law 93-641) divided the United States into about 200 Health Service Areas—some areawide and others statewide. Each area has a Health Service Agency with a staff and a governing body composed of providers and consumers of health services and including locally elected public officials and their representatives. The first job of these agencies is to determine the health needs and resources of their area. They will then use this knowledge to develop a Health Systems Plan (HSP) and an Annual Implementation Plan (AIP).[12] After public hearings, such plans will be adopted at the local level and approved at the State level.

For the most part, these plans will consist of goals and objectives to be achieved and the standards and criteria to be used in reaching them. How to achieve a goal such as "access to primary care in 20 minutes or within 15 miles for 80 percent of the population" or "*x* number of doctors per *y* number of people" will be up to the local communities, other nonprofit organizations or private business. The HSA does not itself implement these plans. However, there are three main ways in which it can influence implementation.

1. The HSA should be in close communication with provider and consumer groups interested in health problems throughout its area. Thus, its planning staff and board members can act as catalysts to get others to take action. Once HSPs and AIPs are approved, the HSA will have limited funds with which to provide financial assistance to organizations so they can draw up plans for projects to be financed from public or private sources.[13]

2. One of the HSA's jobs is to provide technical assistance. Under this heading, the HSA could explain to the local community the options open to it and direct its attention to the programs that go to make up the Rural Health Initiative. At that point, staff associated with those programs would provide the community with

[12] For many HSAs, this should not be as great a task as it may seem since they will build on the information and plans already developed by the Comprehensive Health Planning Councils, Regional Medical Programs, and Hill-Burton (facilities construction) Program that were consolidated, revised, and replaced by Public Law 93-641.

[13] "The agency (HSA) shall seek, to the extent practicable, to implement its HSP and AIP with the assistance of individuals and public and private entities in its health service area: [4, sec. 1513(c)(1)]. "The agency shall . . . make grants . . . to assist them in planning and developing projects . . ." [4, sec. 1513(c)(3)].

the needed technical assistance; but the HSA would be kept informed of progress [4, sec. 1513(c)(2)].

3. The HSA has a review and comment duty with regard to granting most health related Federal funding applications [4, sec. 1513(e)]. The HSA is also to be consulted by the State agency charged with administering the State's certificate of need law covering other "new institutional health services" [4, sec. 1523(a)(4)(B)]. It is through this function that the HSA discharges its responsibility for "preventing unnecessary duplication of health resources" [4, sec. 1513(a)(4)]. Ideally, it does this by bringing together, before their planning has advanced very far, groups developing similar or complementary projects either in the same community or in nearby communities.

The staff connected with the Bureau of Community Health Services can do this with regard to the core programs of the current Rural Health Initiative. However, it may not be aware of what is being planned by those seeking funds from other agencies in HEW, the Department of Housing and Urban Development, the Department of Agriculture under the Rural Development Act, or private enterprise.

There are many areas of rural America which have poor health and/or inadequate health services. Solving their problems will require planning agencies, funding agencies, communities, private enterprise, providers, consumers, and public officials to all work together.

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APPENDIX A–CRITERIA FOR CHMSA DESIGNATION

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Public Health Service

CRITICAL HEALTH MANPOWER SHORTAGE AREAS

Designations and Withdrawals

Section 329(b) of the Public Health Service Act, as amended by the Emergency Health Personnel Act Amendments of 1972 (Pub. L. 92-585), provides that the Secretary of Health, Education, and Welfare shall designate those areas which he determines have critical health manpower shortages and thus would be areas eligible for assignment of National Health Service Corps personnel. On October 23, 1974, a list of areas was so designated in the Federal Register (39 FR 37156).

The purpose of this notice is, first, to update the list of such areas by adding to such previously published list areas of the United States which the Secretary has now determined meet the criteria for such designation. Further, this notice sets forth and clarifies the procedures utilized by the Secretary in making such a designation. In addition, notice is also given that the designation of certain areas (specified separately below) as shortage areas will be withdrawn effective May 27, 1975.

With respect to the designation of areas, §23.5(b) of the regulations governing the National Health Service Corps program (42 CFR Part 23) provides that in determining whether an area has a critical health manpower shortage the Secretary shall take into account, where applicable, the following factors: (1) health resource statistics; (2) health status indicators; (3) accessibility of health care services in the community and the ability of the community to obtain those services on a timely basis; and (4) other socioeconomic, demographic, and environmental factors of community life affecting the ability to procure such services.

In applying the first and third of the above referred to factors, the Secretary adopted the specific measures listed below and requested the appropriate areawide comprehensive health planning agencies or State comprehensive health planning agencies to identify those areas within their respective jurisdictions which met or exceeded those measures:

(a) *For critical medical shortage areas* (physician and physician extenders): (1) If the area in question consists of a group of census tracts within a city it must have (i) a primary care physician-to-population ratio of less than 1 to 4,000, (ii) no neighborhood health center, (iii) no organized hospital outpatient department within 10 miles of the center of the area, and (iv) a primary care physician-to-population ratio of less than 1 to 3,000 within the entire county in which the shortage area is located; (2) If the area in question is a group of census tracts within a county (not located in a tracted city) it must have (i) a primary care physician-to-population ratio of less than 1 to 4,000, (ii) no neighborhood health center, (iii) no organized hospital outpatient department within 20 miles of the center of the area, and (iv) a primary care physician-to-population ratio of less than 1 to 3,000 within the entire county in which the shortage area is located; (3) If the area in question is made up of one or more minor civil divisions or census county divisions within an untracted county (or counties), it must have (i) a primary care physician-to-population ratio of less than 1 to 4,000 within the boundaries of the shortage area itself and (ii) a primary care physician-to-population ratio of less than 1 to 3,000 within the entire county in which the shortage area is located; (4) If the area in question is an entire county, it must have a primary care physician-to-population ratio of less than 1 to 4,000.

In making the above determinations, primary care physicians are defined to include: (1) in metropolitan areas, physicians in general or family practice, internal medicine and pediatrics; and (2) in non-metropolitan areas, physicians in general or family practice, internal medicine, pediatrics, obstetrics and gynecology, and general surgery; *provided, however,* that those physicians spend 50 percent or more of their time in the practice of primary care. Further, interns, residents, and physicians employed by the Federal Government are not included in making such determinations.

(b) *For critical dental shortage areas*: (A) If the area in question consists of an entire county, a minor civil division or a census county division or a group of census tracts within a county, the overall dentist-to-population ratio (including general and specialty practice dentists) in the county within which the area is located must be less than 1 to 5,000. (B) If the area in question consists of a group of census tracts within a city, the overall dentist-to-population ratio within that city must be less than 1 to 5,000.

In making the above determinations, only dentists spending 50 percent or more of their time giving direct patient care are counted and dentists employed by the Federal Government are not included.

After reviewing the areas identified by the health planning agencies, and also taking into account health status indicators as well as socioeconomic, demographic, and environmental factors affecting the community's ability to procure health services, the Secretary has designated the following areas (counties, or specified parts of counties) as having critical medical and/or dental shortages.

List of 673 Critical Medical Shortage Areas followed.

APPENDIX B–TECHNICAL NOTE ON CHP AREAS

For the profile (*2*), all counties of the United States were assigned to a CHP area. (Alaska and New England were omitted because of data problems.) The State CHP agencies were asked to report how their States were to be divided into areas, what organizational activity was going on, and the type of agency. Since it was believed that State agency delineations represented long range plans while 314(b) funding represented the momentary situation, it was decided to follow the State agency delineation whenever the two differed. In some cases the State agency was unable or unwilling to assign a county to an area. In that case, an assignment was made by the author after looking at planning and development district boundaries and at road patterns.

For many analytical purposes it was felt that formation status could be important. It was also believed that the substance rather than the technical point of whether an area was a 314(b) organization or not was the important point. Therefore, "funded" status was assigned to 1) 314(b) agencies, 2) those with other Federal funds that appeared to be well developed and planning, and 3) to those areas where the State said it would do the planning and no (b) agencies would be funded. This status was also given to CHP areas formed by the splitting or combining of 314(b) agencies. The cut-off date for delineation and formation status was May 1973.

Land area data came from the tape for the Bureau of the Census' *City and County Data Book, 1967*. Infant mortality figures are an average of those derived from the HEW *Vital Statistics series for 1966-68*. CHMSA data is from a list provided by the National Health Service Corps (see footnote 2). The rest of the data are from the first and fourth count tapes of the 1970 census.

AER No. 339 (see back cover) contains more information on area delineation and organization. Supplements provide even greater detail.

APPENDIX C–HEW REGIONAL OFFICES

Since personnel and phone numbers are subject to change, only the regional office and address are listed. Ask for the National Health Service Corps consultant or the National Health Planning consultant, as appropriate.

REGION I	
Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont	John F. Kennedy Federal Building Government Center Boston, Massachusetts 02203
REGION II	
New York, New Jersey, Puerto Rico, Virgin Islands	Federal Building 26 Federal Plaza New York, New York 10007
REGION III	
Delaware, Maryland, Pennsylvania, Virginia, West Virginia & District of Columbia	P.O. Box 13716 Philadelphia, Pennsylvania 19101
REGION IV	
Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee	50 Seventh Street, NE Atlanta, Georgia 30323
REGION V	
Illinois, Indiana, Michigan, Minnesota, Ohio, Wisconsin	300 South Wacker Drive Chicago, Illinois 60606
REGION VI	
Arkansas, Louisiana, New Mexico, Oklahoma, Texas	1200 Main Tower Bldg. Dallas, Texas 75202
REGION VII	
Iowa, Kansas, Missouri, Nebraska	601 East 12th Street Kansas City, Missouri 64106
REGION VIII	
Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming	1961 Stout Street Denver, Colorado 80202
REGION IX	
Arizona, California, Hawaii, Nevada, Guam, Trust Territory of Pacific Islands, American Samoa	Federal Office Building 50 United Nations Plaza San Francisco, California 94102
REGION X	
Alaska, Idaho, Oregon, Washington	Arcade Plaza 1321 Second Avenue Seattle, Washington 98101

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Some Related Publications–

There are some related publications you may find helpful: "A Profile of U.S. Comprehensive Health Planning Areas," AER No. 339, and supplemental data–"Characteristics and County Composition of CHP Areas." Supplements were published for Standard Federal Regions II, III, and V; Region IV; Regions VII and VIII, and Regions VI, IX, and X.

PROFILE: The profile describes the 416 CHP areas–"funded," developing, and undeveloped as planned by the State agencies, May 1973. It gives special emphasis to rural areas.

Characteristics summarized in the profile include: **Organizational variables**–agency type, formation status, source of planning funds, area type, and congruence with general purpose planning districts. **Socioeconomic variables**–land area, total, urbanized area, rural, minority populations, three age groups, aggregate and per capita income, and poverty status. **Variables more closely related to health care delivery**–births and infant mortality, poor housing, and lack of a phone.

By region and area type, two types of tables are presented:

Type 1–Averages and percent distribution of the above-mentioned variables.

Type 2–Number of CHP areas with wide deviations from such averages.

SUPPLEMENTAL DATA: The supplements present data for the variables summarized in the profile for component counties, CHP areas, and CHP States, by Standard Federal Regions. Footnotes update the CHP area organization, showing transition to Health Service Areas (HSAs) as of September 1975, and County 314(b) status according to Health, Education, and Welfare's October 1974 CHP Directory.

TO ORDER COPIES: Copies of these reports may be obtained from National Technical Information Service, 5285 Port Royal Road, Springfield, Virginia 22161. When ordering, please specify title and NTIS accession number; and indicate whether you want paper copy or microfiche. To avoid delays, send exact amount indicated. Include zip code for your return address.

A Profile of U.S. Comprehensive Health Planning Areas. AER No. 339. No longer available from ERS. Available NTIS only, as PB262749. Paper copy $4.00 each.

Supplemental Data: Characteristics and County Composition of CHP Areas.
Regions II, III, and V. Available NTIS only, as HRP 0013726. Paper copy $5.00 each.
Region IV. Available NTIS only, as HRP 0013729. Paper copy $4.50 each.
Regions VI, IX, and X. Available NTIS only, as HRP 0013728. Paper copy $4.50 each.
Regions VII and VIII. Available NTIS only, as HRP 0013727. Paper copy $4.50 each.

(Microfiche of each of the above publications are also available from NTIS at $3.00 each.)